

On the Maintenance and Initiation of the Intraseasonal Oscillation: A Coupled Ocean-Atmosphere Phenomenon?

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Based on examination of the latent heat flux from the National Centers for Environmental Prediction/National Center for Atmospheric Research reanalysis, we find that evaporative wind feedback (WISHE) and frictional wave-CISK (conditional instability of the second-kind] are not the dominant mechanisms for promoting the eastward propagation of the intraseasonal oscillation since evaporation to the west of the convection dominates. The initiation of convection over the Indian Ocean occurs over warm sea-surface temperature (SST) anomalies. There is a systematic association between convection, SST and latent heat flux that appears to modulate the eastward propagation of the intraseasonal oscillation over the Indian Ocean and western Pacific. To the east of the convection, where subsidence occurs, warm SST anomalies develop. Subsequently, these locations are the preferred sites for the development of convection, and the convective envelope expands eastward. Decreasing SSTs near the western portion of the convective envelope are associated with the enhanced latent heat flux (and possibly cloud shielding), and are linked to the cessation of convection. Thus, it appears the intraseasonal oscillation should be treated as a coupled air/sea mode. It is suggested that lack of an interactive ocean may be associated with the systematic failure of the Atmospheric Model Intercomparison Project (Gates 1992) models to simulate intraseasonal variability (Slingo et al. 1996; Sperber et al. 1996).

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